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BEFORE THE ARIZONA CORPORATION COMMISSION

BOB STUMP, Chairman
GARY PIERCE
BRENDA BURNS
BOB BURNS
SUSAN BITTER SMITH

IN THE MATTER OF ARIZONA PUBLIC SERVICE COMPANY REQUEST FOR APPROVAL OF UPDATED GREEN POWER RATE SCHEDULE GPS-1, GPS-2, AND GPS-3.	Docket No. E-01345A-10-0394
IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR APPROVAL OF ITS 2013 RENEWABLE ENERGY STANDARD IMPLEMENTATION FOR RESET OF RENEWABLE ENERGY ADJUSTOR.	Docket No. E-01345A-12-0290
IN THE MATTER OF THE APPLICATION OF TUCSON ELECTRIC POWER COMPANY FOR APPROVAL OF ITS 2013 RENEWABLE ENERGY STANDARD IMPLEMENTTION PLAN AND DISTRIBUTED ENERGY ADMINISTRATIVE PLAN AND REQUEST FOR RESET OF RENEWABLE ENERGY ADJUSTOR.	Docket No. E-01933A-12-0296
IN THE MATTER OF THE APPLICATION OF UNS ELECTRIC, INC. FOR APPROVAL OF ITS 2013 RENEWABLE ENERGY STANDARD IMPLEMENTATION PLAN AND DISTRIBUTED ENERGY ADMINISTRATIVE PLAN AND REQUEST FOR RESET OF RENEWABLE ENERGY ADJUSTOR.	Docket No. E-04204A-12-0297 **NOTICE OF FILING DIRECT TESTIMONY OF RICK GILLIAM ON BEHALF OF THE VOTE SOLAR INITIATIVE**

The Vote Solar Initiative ("VSI"), through its undersigned counsel, hereby provides notice that it has this day filed the direct testimony of Rick Gilliam in this matter.

DATED this 24th day of April, 2013

ARIZONA CENTER FOR LAW IN THE PUBLIC INTEREST

By _____
Timothy M. Hogan
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ORIGINAL and 13 COPIES of the foregoing filed this 24th day of April, 2013, with:

Docketing Supervisor
Docket Control
Arizona Corporation Commission
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Phoenix, AZ 85007

COPIES of the foregoing Electronically mailed this 24th day of April, 2013, to:

All Parties of Record

_____

DIRECT TESTIMONY OF RICK GILLIAM

ON BEHALF OF THE VOTE SOLAR INITIATIVE

Docket No. E-013458-10-0394
Docket No. E-01345A-12-0290
Docket No. E-OI933A-12-0296
Docket No. E-04204A-12-0297

April 24, 2013

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The Vote Solar Initiative

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DIRECT TESTIMONY OF
RICK GILLIAM

Introduction and Overview

Q. Please state your name and business address.

A. My name is Rick Gilliam. My business address is 1120 Pearl Street, Suite 200 in Boulder, Colorado.

Q. On whose behalf are you submitting this rebuttal testimony?

A. This testimony is submitted on behalf of The Vote Solar Initiative ("Vote Solar").

Q. By whom are you employed and in what capacity?

A. I serve as Director of Research and Analysis for Vote Solar, and oversee policy initiatives, development, and implementation.

Vote Solar is a non-profit grassroots organization working to foster economic opportunity, promote energy independence and fight climate change by making solar a mainstream energy resource across the United States. Since 2002 Vote Solar has engaged in state, local and federal advocacy campaigns to remove regulatory barriers and implement key policies needed to bring solar to scale. We have nearly 2,500 Arizona members.

Q. Please describe your experience in utility regulatory matters.

A. Prior to joining Vote Solar in January of 2012, my regulatory experience included five years in the Government Affairs group at Sun Edison, one of the world's largest solar developers, twelve years at Public Service Company of Colorado as Director of Revenue Requirements and twelve years with Western Resource Advocates (WRA – formerly known as the Land and Water Fund of the Rockies) as Senior Policy Advisor. Prior to that, I spent six years with the Federal Energy Regulatory Commission. All told, I have in excess of 30 years of experience in utility regulatory matters. A summary of my background is attached as Appendix A.

Q. Have you previously testified before the Arizona Corporation Commission ("ACC" or "Commission")?

A. Yes. I testified before this Commission on behalf of Vote Solar in the recent Tucson Electric Power Rate Case, and on behalf of the LAW Fund in some of the early proceedings regarding the development of a renewable standard. I have also participated in a number of rulemakings in the intervening period.

Q. Before what other utility regulatory commissions have you testified?

A. I have testified in proceedings before the Public Utilities Commission of Colorado, Nevada Public Utilities Commission, the New Mexico Public Regulation Commission, the Utah Public Service Commission, the Wyoming Public Service Commission and the Federal Energy Regulatory Commission.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to respond to the direct testimony of APS witness Greg Bernosky and TEP witness Carmine Tilghman regarding the Companies' proposals to waive and then eliminate the distributed energy component of the Renewable Energy Standard, and to propose an alternative means of renewable energy credit ("REC") acquisition for compliance purposes.

Q. Please summarize your testimony.

A. This proceeding is very important in the evolution of the electric utility industry in Arizona. The major utilities are part way through the growing renewable energy compliance requirements, and certain technologies, notably photovoltaics or PV, are approaching an economic junction where direct financial incentives may be no longer needed to encourage homeowners and businesses to install solar generation on-site. Unfortunately, it is not a bright line.

As in most states with a customer-sited component in its renewable energy standard, utility compliance has been proven by the acquisition and retirement of sufficient RECs associated with customer-sited renewable electricity generation. Such RECs are acquired in exchange for incentive payments. If the economics of customer-sited solar deployment reach a point where retail customers are willing to install solar on their homes and businesses without financial incentives[1] from their utility, how can the utility acquire the RECs necessary to prove it is in compliance?

[1] It should be noted that some customers have already requested net metering service without receiving a utility incentive; see TEP witness Tilghman direct testimony, pages 4-5.

The utilities' answer is to waive the requirement in the near term, and eliminate it in the medium term. This approach solves the compliance problem by having nothing with which to comply, however it defeats the purpose of the renewable energy standard. Vote Solar's proposal is to leave intact the standard including A.A.C. R14-2-1805, the Distributed Renewable Energy Requirement, and find the lowest cost method for acquiring the credits needed for compliance.

Q. Please characterize Vote Solar's interest in this proceeding.

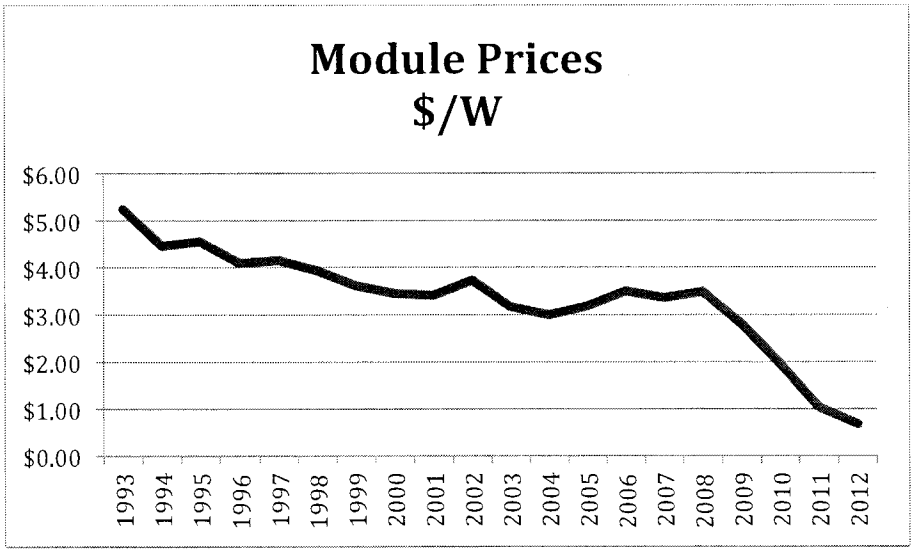
A. Vote Solar is interested in this proceeding because we view Arizona as one of the first major solar markets in which solar electricity prices are approaching the price of grid-supplied electricity. Continuation of current trends could lead to a point where incentives are no longer needed, all else being equal. These parity economics are highly dependent on a number of factors, not the least of which is the outcome of the APS technical conference process addressing net metering. This docket will address a number of proposals for supporting continuation of a strong stand-alone solar market. It is these trends and changes and the associated debate that interest Vote Solar.

Background

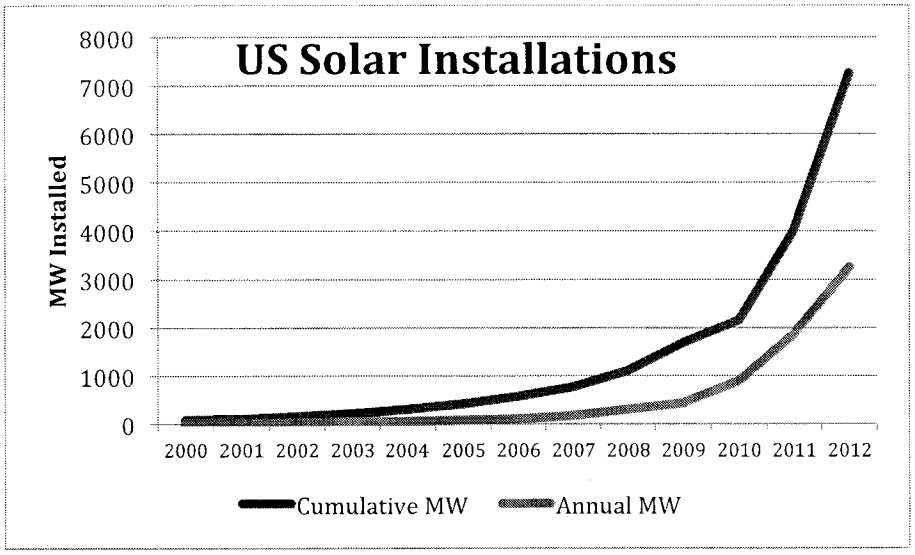
Q. How did the need for this proceeding come about?

A. This proceeding is a reflection of the success of the solar industry. The cost of solar has come down dramatically since the Renewable Energy Standard and

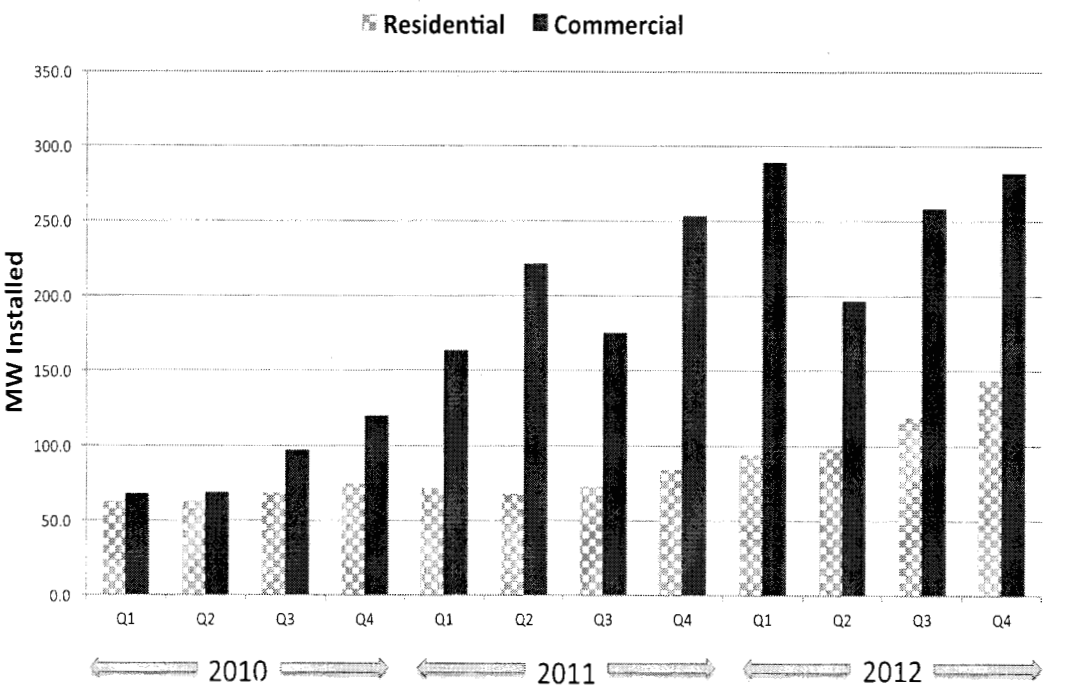
Tariff (REST) was implemented in 2006. The following chart shows the cost of solar modules on a $\$/W_{DC}$ basis over the past 20 years.



As a result of these steep cost declines, driven in large part by increased demand and resulting growth in manufacturing, and the associated economies of scale and efficiencies, deployment of solar energy resources, especially PV, has grown nearly as dramatically – averaging over 75%/year for the last five years.



The growth has occurred across the spectrum of market segments – utility scale, commercial on-site, and residential on-site. As the latter two categories are of interest in this proceeding, the following chart[2] shows the deployment by major market segment over the last few years across the United States.

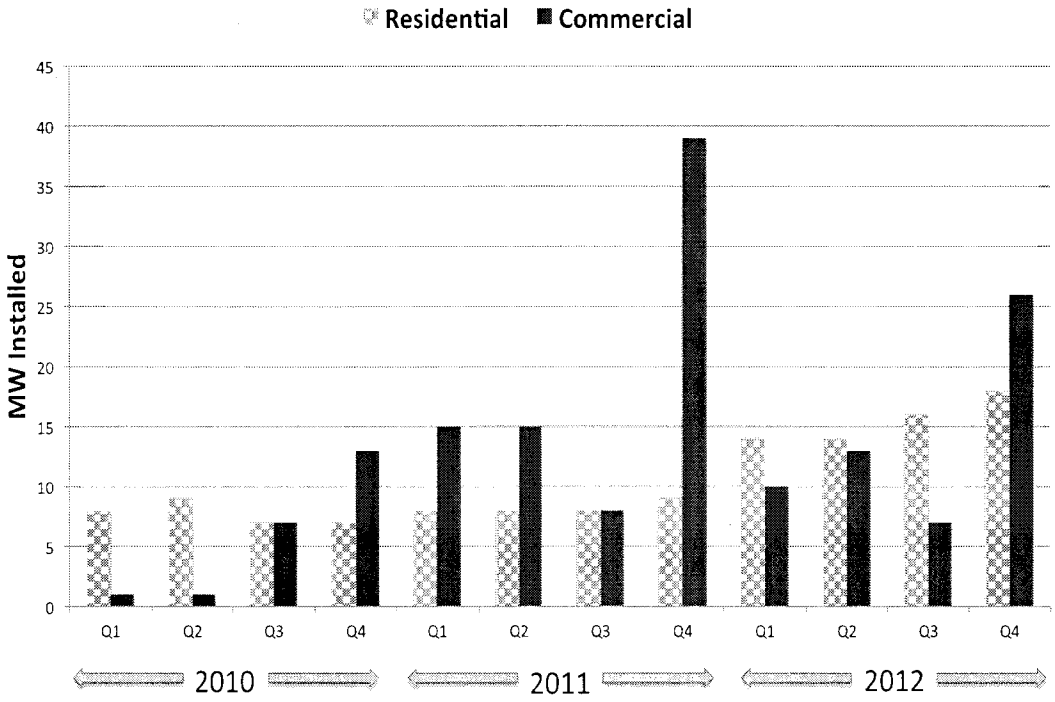


Q. How have Arizona's markets grown?

A. Arizona has been a leading state for solar development in no small part because of the vast amount of sunshine that the state enjoys. In 2012, Arizona moved into second place behind only California for the most MWs installed both for the year and cumulatively, and leads the nation with the highest solar capacity per capita. While the 2012 growth was in large part due to utility scale solar coming

[2] Source: SEIA/GTM Research, U.S. Solar Market Insight

on line, the customer-sited market performed very well, too, as the following chart[3] demonstrates:



Q. Has the Arizona solar market created significant jobs?

A. Yes. According to a recent report from The Solar Foundation,[4] there are nearly 10,000 solar jobs in the state - the highest level in the nation per capita. One of every 300 working people in Arizona work in the solar industry.

Q. Has the REST played a role in this growth?

A. Yes. The REST has played a very important role in diversifying the generation resources for the ACC-jurisdictional utilities, not just to renewably generated electricity in large centralized plants, but also through the Distributed Renewable

[3] Ibid.
[4] Source: http://thesolarfoundation.org/solarstates

Energy Requirement (Section 1805) that promoted small systems on homes and businesses. For the first time, electricity consumers at all levels had a choice for their source of electricity. Not only was customer choice now a reality, but in the process jobs were created and the money spent on energy stayed in Arizona rather than going to out-of-state coal and natural gas producers, further helping to boost the state's economy.

As noted above, compliance with Section 1805 was demonstrated by acquiring Renewable Energy Credits or RECs from the owners of customer-sited solar generating systems in exchange for payments from the utility.

Renewable Energy Credits and REST Compliance

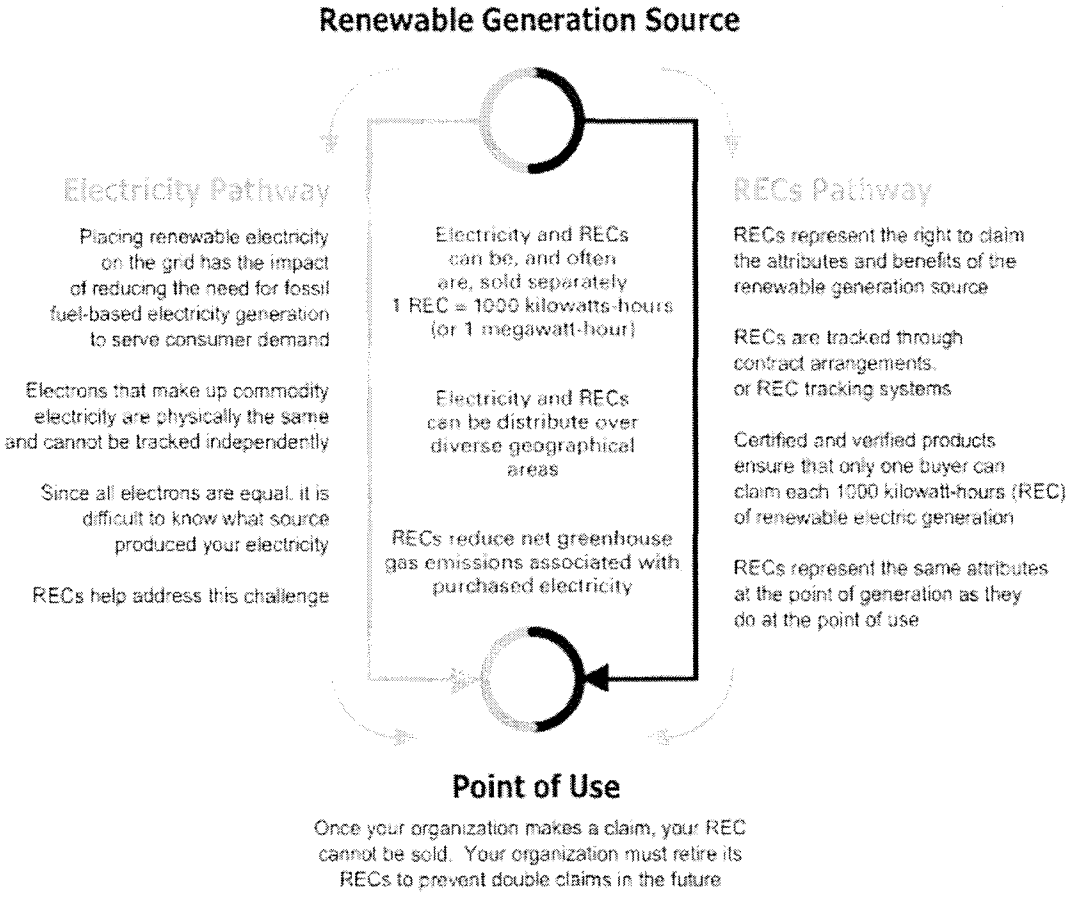
Q. What is a Renewable Energy Credit or REC?

A. The REST defines Renewable Energy Credit (sometimes known as a Renewable Energy *Certificate*) as "the unit created to track kWh derived from an Eligible Renewable Energy Resource or kWh equivalent of Conventional Energy Resources displaced by Distributed Renewable Energy Resources." More commonly, RECs are defined to include non-energy attributes, "including any and all credits, benefits, emissions reductions, offsets, and allowances, howsoever entitled, directly attributable to a specific amount of electric energy generated from a renewable energy resource."[5]

RECs are created whenever a renewable resource generates electricity,

[5] From the definition of RECs in the Colorado PUC Rules.

regardless of whether the utilities in the state (and territory) in which the project is located have a compliance obligation. The owner of the renewable energy system generally owns the RECs unless contractually transferred to another entity. The following chart[6] lays this out graphically:



Q. Do RECs have value?

A. Yes. There are two markets for RECs. The first is the compliance market, in which RECs are used by a utility or other energy provider to comply with a state renewable requirement. The second market is a non-compliance (sometimes

[6] Source: http://www.epa.gov/greenpower/gpmarket/rec_chart.htm

known as voluntary) market in which individuals, businesses or local governments acquire RECs to achieve certain sustainability or climate change goals. There are many companies[7] operating at the national, regional and state level that acquire and aggregate RECs from individual projects for resale to individuals and organizations. One of the largest, Bonneville Environmental Foundation (BEF), defines RECs as follows:

> A **Renewable Energy Certificate**, or REC, is a tradable, legal mechanism that represents the environmental benefits associated with one megawatt-hour of electricity generated from a renewable energy resource. These certificates may be sold and traded and the owner of the REC can legally claim to have purchased renewable energy. RECs incentivize the production of renewable energy by providing a source of revenue to electricity generated from renewable sources.

Q. Why would individuals, businesses or other organizations purchase RECs?

A. BEF notes the rationale for businesses to purchase RECs includes:

- To offset the carbon emissions associated with their electricity use
- To choose renewable power when their local utility does not offer a green power option
- To consolidate procurement of renewable energy for multiple locations instead of buying renewable electricity from multiple suppliers
- To offset electricity used for special events, such as conferences, when a direct purchase is not possible

To my knowledge, no one in this proceeding disputes that RECs have value outside of the Arizona compliance market.

Q. In the non-compliance market, how can purchasers be assured they are receiving the values they are purchasing?

[7] See http://www.green-e.org/base/re_products#res

A. The RECs in voluntary markets are usually certified. The leading independent certification organization is the Center for Resource Solutions which administers the Green-e program. This program has been around since 1997 and certifies and verifies over two-thirds of the RECs in the voluntary markets. In 2011 Green-e Energy certified more than 27 million MWh that was sold to over 713,000 retail customers. Based on the most recently available National Renewable Energy Laboratory data, Green-e Energy certified sales are estimated to make up over 99% of all retail REC sales in the U.S. and roughly two thirds of the retail renewable electricity sales in the U.S.[8]

Q. Would you say that the REST has "run its course?"

A. Not at all. The REST was implemented in 2006 and was designed to increase the diversity of resources on the utilities' grids through 2025, and maintain those minimum levels of renewables beyond. We are less than halfway through the growth period of this policy and, importantly, it has been working as intended. The major utilities have been able to meet their targets ahead of schedule in some cases. For example, APS and TEP have acquired sufficient Renewable Energy Credits (RECs) to meet the non-residential portion of the Section 1805 standard to nearly 2020. It is partly on this basis that the Commission eliminated incentives for non-residential solar installations. Notwithstanding this development, the utilities are still required to comply with the REST.

[8] http://www.green-e.org/docs/2011%20Green-e%20Verification%20Report.pdf

Q. Is this an appropriate time for the Commission to address the Distributed Renewable Energy Requirement?

A. In my view, it is premature. For example, we don't know how, if at all, other important clean energy policies such as net metering may change in the near future. Such changes have the potential to dramatically affect the economics of customer-sited solar, which in turn can impact its future rate of deployment and incentive levels.

The Utility Proposals

Q. Can you summarize how APS and TEP propose to comply with the DE standard when incentives are no longer available to use to acquire RECs for compliance?

A. Yes. APS proposes to "no longer have a firm DE requirement" but create a "track and record" process in which APS measures the incremental energy produced by eligible distributed renewable energy systems and reports it to the Commission for informational, but not compliance, purposes. It believes this method solves the problem of generation owners retaining ownership of the RECs created by their renewable generation. Mechanically, it proposes a waiver of the rules initially when cash incentives are eliminated, and over the longer term a change to the rules.

TEP proposes to simply eliminate the requirement as currently designed. It feels the standard is based on customer behavior and that, without incentives, the utility does not participate in the decision making process. It does go on to

suggest an interim solution is necessary until the Commission carries out its suggestion. In this regard, it proposes a waiver of the Distributed Renewable Energy Requirement.

Q. Does the APS track and record proposal avoid the double counting of customer's solar generation?

A. I think it is very unclear whether the new APS track and record proposal truly has no impact on the value of customer-owned RECs. Anytime kWh are used to track compliance with the RES, the utilities are benefitting from RECs they do not own. RECs cannot retain their value in the voluntary market if their underlying kWh are being used for compliance purposes. If there is any uncertainty around that question, REC aggregators are likely to look elsewhere. Organizations like the Center for Resource Solutions are the national experts in this field and should be consulted before any new policy is adopted.

Q. Do the utilities make any other suggestions?

A. Yes. APS alludes to "some form of DE incentives" that may exist "as a policy matter" separate from direct cash incentives. It's unclear whether APS may be referring to net metering, interconnection, or some other policy matter, thus it is difficult to respond. On the other hand, TEP is quite direct in its alternative proposal that RECs be transferred to the utility in exchange "for the benefits associated with net metering."

We disagree with these suggestions for a number of reasons. First, no Arizona utility has proven any net cost exists associated with net metering. Moreover, the Commission has not ruled on the issue.

Second, APS is facilitating a series of technical conferences right now, in which TEP, SRP, staff, RUCO and many other traditional Commission stakeholders are participating, that is scheduled to continue into the summer. There is a great deal of new data and information coming out of this process and it is extremely premature and inappropriate for the utilities to draw conclusions at this time.

Third, due to the variety of distributed renewable energy sizes, technologies, and configurations deployed on homes and businesses, and the diversity of electric rates and rate structures, the net benefits and costs associated with net metering will of course vary dramatically, making any broadly applied value assumption incorrect.

Fourth, TEP options 2 and 3 would likely result in the Utilities claiming RECs they have not paid for nor acquired from the owner through a specific transfer, and don't own. Option 3 is unclear whether it applies to past net-metering agreements or only future net-metering agreements and thereby risks invalidating contracts for REC sales that have already been made. While not directly taking the RECs for compliance, option 3 proposes to use the kWh to "Track and Reduce" the utility's Annual Distributed Renewable Energy Requirement by that amount. This proposal is effectively the same as the APS

"Track and Record" and would also leech the value out of the RECs and render them valueless and likely uncertifiable by Green-e Energy.

Q. Do you have any other comments on the utility proposals?

A. Yes. There are interdependent elements in the REST that could be impacted by adopting the utility proposal to eliminate Section 1805. For example, there are other technologies besides solar PV such as solar domestic water heating covered by Section 1805 that would be penalized by striking this section.

The Vote Solar Proposal

Q. Does Vote Solar have a proposal to address the zero-incentive issue?

A. Yes. Because RECs have value that could be compromised by the APS track and record proposal, we suggest an administratively simple and low-cost market-based method for continued acquisition of RECs when incentives are zero that maintains the integrity of the REST.

Given that the major utilities (TEP and APS) appear to have sufficient non-residential RECs to comply with Section 1805 for some time, we propose the issuance of a periodic standard offer for Residential RECs from systems that are installed after the incentives for residential solar are eliminated. Initially, we suggest a quarterly offer for a limited number of RECs to begin to get a feel for the market value. REC owners should also be encouraged to offer RECs at a price lower than the standard offer, which would be acquired first, in order of cost. Over time, the offers and timing can be refined. We suggest the following

guidelines:

- The standard offer should be issued quarterly or semi-annually via a website (with notification through the monthly newsletter included in each bill) and should remain open for a few days or weeks depending on market response;
- The utilities should set an initial price at a low rate and ratchet up the price, if necessary, to gather sufficient RECs for compliance (at the utility's discretion to pay as-bid or set a market-clearing price)
- The Standard offer should be open to system owners and third party aggregators who acquire RECs and/or bid them on customer's behalf.

This is certainly not a new approach. In fact, utilities and load-serving entities are actively conducting market-based solicitations to obtain RECs in the following states: California, Colorado, Connecticut, Delaware Illinois, Maryland, Massachusetts, New Jersey, New Mexico, New York, Ohio and Pennsylvania. Arizona utilities have used a similar approach in soliciting non-residential solar projects, as well.

Q. What are the advantages of this approach?

A. This procurement method is consistent with Arizona law and Commission rules and does not require special consideration, creative work-arounds, obfuscating semantics, rule modifications or on-going waivers. Indeed, it is similar to the method used by the IOUs to acquire commercial solar RECs in the early days of the standard. It uses the market to assure that residential RECs are acquired at the lowest cost while respecting the property rights of solar system owners. Third, it avoids unnecessary complexity, administrative or regulatory burdens and

uses a mechanism with which the utilities are quite familiar.

Finally, it puts Arizona in a leadership position on valuing RECs so that as other state markets reach a similar point in their evolution, Arizona utilities will have a competitive advantage.

Q. Can this proposal be implemented immediately?

A. In my view, yes. Any internal administrative work required can occur prior to the elimination of incentives. However, if the utilities feel they need more time, we would support a waiver of the residential portion of Section 1805 for up to one year to prepare.

Recommendation

Q. Please summarize your recommendations in this testimony.

A. I recommend first that the Commission not take any near term action in this proceeding that could result in a loss of value in customer's property, i.e. the RECs that they own.

Second, I recommend that the Commission not reopen the REST rules at this time, but rather use the time during which incentives for residential solar are still available to investigate the lowest cost options through which utilities could acquire RECs. This will also provide the time necessary for other policies such as net metering to be more thoroughly reviewed in the context of Arizona utilities. This will allow the Commission to make a more reasoned decision based on

more information on the economics of residential solar, the cost of mechanisms like track and record, and the cost of alternatives.

Q. Does this conclude your direct testimony?

A. Yes, it does.

Rick Gilliam

January 2012 to Present: Director of Research and Analysis, the Vote Solar Initiative, San Francisco, CA. Manages the technical and policy research for Vote Solar, and engages in state, regional, and national campaigns related to key solar market policies.
January 2007 to January 2012: Vice President, Government Affairs, SunEdison, LLC, Beltsville, MD. Directs and manages policy development and implementation for the Americas at the regulatory and legislative levels. (Promoted from *Managing Director* June '09 and from *Director* Sept '07)
Dec 1994 to Jan 2007: Senior Energy Policy Advisor, Western Resource Advocates (formerly the Land and Water Fund of the Rockies), Boulder, Colorado. Develop innovative clean energy and air quality public policies within the economic and cultural framework unique to this region. Lead environmental advocate in development of Arizona Environmental Portfolio Standard, Nevada Renewable Portfolio Standard implementation rules, Colorado Renewable Energy Standard legislative proposals, and the 2003 Utah Renewable Energy Standard legislative proposal. Principal author of Colorado's Amendment 37 and lead advocate for related PUC rule development.
Jan 1983 to Dec 1994: Director of Revenue Requirements, Public Service Company of Colorado, Denver, Colorado. Primary responsibility for development of formal rate-related filings for this investor-owned utility for electric, gas, and thermal energy service in two states and the FERC. Developed and responded to a variety of proposed mechanisms to encourage the use of energy efficiency technologies, including innovative rate design approaches.
Dec 1976 to Dec 1982: Technical Witness (Engineer), Federal Energy Regulatory Commission, Washington, D.C. Testified as expert witness on behalf of the FERC in wholesale rate filings on technical, accounting, and economic issues related to rate design, pricing, and other issues.

A. Education

Masters, Environmental Policy and Management, University of Denver, Denver, Colorado
Bachelor of Science, Electrical Engineering, Rensselaer Polytechnic Institute, Troy, New York

B. Related Publications

Gilliam and Baker, "Green Power to the People," *Solar Today*, July/August 2006.
Dalton & Gilliam, "Walking on Sunshine: Energy Independence on the Rez," *Orion Afield*, Summer, 2002.
Gilliam, Rick, "Revisiting the Winning of the West," *Bulletin of Science, Technology & Society*, April 2002.
Blank, Gilliam, and Wellinghoff, "Breaking Up Is Not So Hard To Do: A Disaggregation Proposal," *The Electricity Journal*, May 1996.

Summary of Formal Testimonies available upon request